CLAIMS

1. Method of clustering images (4) of a video sequence consisting of shots and represented by a graph-like structure, a node of the graph representing a shot or a class of shots defined by key images and the nodes being connected by edges, characterized in that it comprises the following iteration:

- selection of an edge $a_k$ (7) connecting nodes $n_i$ and $n_j$
- calculation of the potential of node $n_m$ (8), merging of the two nodes $n_i$ and $n_j$, as a function of the distances between the attributes of the key images defining the class of shots of node $n_i$ and those of the key images defining the class of shots of node $n_j$ and as a function of the temporal distance of these key images,
- calculation of the potential of each edge (8) connecting the merged node to another node of the graph previously connected to nodes $n_i$ or $n_j$, as a function of the distances between the attributes of the key images defining the class of shots of the merged node and those of the key images defining the class of shots of the other node and as a function of the temporal distance between these key images, the new class of shots associated with the merged node comprising the key images of the classes of shots of the merged nodes,
- merging of the two nodes and validation of the new graph (10) if the energy of this graph, which is the sum of the potentials of the nodes and of the edges, is less than the energy of the graph before merging (9).

2. Method according to Claim 1, characterized in that the graph is initialized by assigning a node to each shot and in that edges are created from one node to another node if the shots relating to these nodes are separated by a predetermined maximum number T of shots.

3. Method according to Claim 1, characterized in that the value of potential associated with the edges and with the nodes is a respectively decreasing and increasing function of temporal distance.

4. Method according to claim 2, characterized in that the potential of an edge connecting two nodes $n_i$ and $n_j$ is calculated according to the following equation:

$$V_a(n_i,n_j)=\min_{I_k\in P_i,I_l\in P_j}(w_{att}\cdot F_a(K_{att},\widetilde{d}_{att},d_{att}(I_k,I_l))+w_T\cdot F_a(K_T,\widetilde{d}_T,d_T(I_k,I_l)))$$

and in that the potential of a node born from the merging of two nodes ni and nj is defined by the following function:

$$V_n(n_m=n_i\cup n_j)=\min_{I_k\in P_i,I_l\in P_j}(w_{att}\cdot F_n(K_{att},\widetilde{d}_{att},d_{att}(I_k,I_l))+w_T\cdot F_n(K_T,\widetilde{d}_T,d_T(I_k,I_l)))$$

where:

$P_i$ represents the class of shots associated with node $n_i$ and comprising images $I_k$

$F_a$ is a decreasing function

$F_n$ is an increasing function

$w_{att}$ and $w_T$ represent the weights related to attributes and to time

$d_{att}(I_k,I_l)$ is the distance function associated with the characteristic attributes of the two images

$\widetilde{d}_{att}$ represents the mean of the distances between images calculated on the initial graph

$d_T(I_k,I_l)$ is the temporal distance separating the two images

$\widetilde{d}_T$ is equal to T which represents the temporal threshold

$K_{att}$ and $K_T$ are two constants.

5. Method according to claim 4, characterized in that the decreasing function is of the form

$$F_a(K,\widetilde{d},d)=\frac{1}{1+e^{\frac{K}{\widetilde{d}}(d-\widetilde{d})}}$$

and in that the increasing function is of the form

$$F_n(K, \tilde{d}, d) = 1 - \frac{1}{1 + e^{\frac{K}{\tilde{d}}(d - \tilde{d})}}$$

6. Method according to claim 1, characterized in that the iterations are stopped as soon as the potential merging of two nodes (8) gives rise to an increase in the energy (9), the edges being selected (6), for the calculation of the mergings, in decreasing order of their value of potential.